



# Businesses optimism amid the Covid-19 Pandemic

Ningyu Wang

## Motivation

Business optimism is important for economic recovery after the pandemic. It is more important to learn more about what variables will impact the business's optimism.

## Objective

Determine if businesses in counties with a larger population will grow less optimistic after the pandemic?

## Data

- Most variables value come from the Nebraska Economic Conditions Survey in 2020. The surveys are sent out each month to 500 randomly selected Nebraska businesses.
- Due to the pandemic, the survey was suspended from March to June.
- The population data for each county is from US Census

## Model

Using Logistic Regression to estimate the chances that whether business expect the dollar sales volume will increase in the next 6 months

- **Logistic Regression Equation**

$$E(y) = \frac{e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}}{1 + e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p}}$$

- **Dependent variable**

- 1 represents businesses expect the sales volume to increase
- 0 represent businesses expect the sales volume to decrease or stay the same

- **Independence variable:**

- County Population

- **Control variables:**

- Industry
  - Retail and hospitality
  - Goods producing
  - Health care and Social Assistance
  - Other Industries
- Employment Size
- Post Pandemic Month (0-before March,1-after June)

## Results

Variable	Coefficient	Margin Effect	P-value
Good Producing Industry	-0.58562	-0.0949	0.251
Health Care & Social Assistance Industry	0.20734	0.0407	0.674
Other Industries	0.06118	0.0116	0.883
Post Pandemic Month	-0.03978	-0.0073	0.980
Employee Size (log)	0.26386	0.0485	0.133
Population (log)	0.01237	0.0023	0.932
Interact month with Population	-0.00524	-0.0010	0.975
Interact month with Good Producing Industry	1.00148	0.1839	0.093*
Interact month with Health Care & Social Assistance Industry	0.71287	0.1309	0.212
Interact month with Other Industries	0.25850	0.0475	0.600
Interact month with employment size	-0.40104	-0.0737	0.054*
*Significant at 10% level      N=1039      AIC= 821      R^2: 0.02243			

## Conclusion

- The population of the county does not have a significant impact on business optimistic levels at all.
- Before the pandemic, variables in the model do not influence optimism levels. The influence of businesses size (employment) on optimism falls after the onset of pandemic while the optimism of Good Producing firms rises (relative to Retail and hospitality firms).

## Reference

NFIB Research Center (2021). *15th edition Small Business COVID-19 survey Report*. Retrieved from [https://assets.nfib.com/nfibcom/Covid-19-15-Questionnaire\\_.pdf](https://assets.nfib.com/nfibcom/Covid-19-15-Questionnaire_.pdf)

## Limitation

The survey response rate is about 20%, which is not relatively high, can lead to response bias.